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Standards of Performance for New Stationary Sources Asphalt Processing and Asphalt Roofing Manufacture: Enforcement Aspects Statement and Reports Impact Analysis

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STANDARDS OF PERFORMANCE FOR NEW STATIONARY SOURCES
ASPHALT PROCESSING AND ASPHALT ROOFING MANUFACTURE

ENFORCEMENT ASPECTS STATEMENT

AND

REPORTS IMPACT ANALYSIS

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The recommended standards of performance will limit the emission of particulate matter from asphalt roofing manufacturing plants and from blowing stills and asphalt storage tanks at oil refineries and asphalt processing plants. These standards include both mass and visible emission limitations. The control systems used by the asphalt roofing industry include high velocity air filters (HVAF), electrostatic precipitators (ESP), afterburners (A/B), baghouses, and mist eliminators. Aspects of enforcing the recommended standards of performance are discussed in the report.

KEYWORDS: *Asphalt plants, *Roofing, *Air pollution control, *Particles, *Standards of performance, *Stationary sources, *Air pollution abatement.

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ENFORCEMENT ASPECTS

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PROCESS OPERATION DURING COMPLIANCE TESTING

The major sources of pollutants in asphalt roofing plants are asphalt blowing stills, asphalt saturators, asphalt storage tanks, and mineral handling and storage areas. Process parameters affecting the quantity of uncontrolled particulate emissions from these sources are production line speed, grade and amount of asphalt used, asphalt temperatures, and methods of storage and handling of materials. In addition, the duration of the blow and the effectiveness of cyclones or knock-out boxes between the still and the afterburner are major factors that affect the amount of pollutant generated from asphalt blowing stills. The addition of a catalyst may also affect the rate of emissions from the blowing still.

Air blowing of asphalt flux is usually a batch operation. A minimum of four batches will be blown each operating day at a typical asphalt roofing plant. Asphalt flux is pumped from the storage tank through a preheater to the blowing still. The asphalt flux is normally preheated to a temperature between 220°C to 230°C (425°F to 450°F). When the blowing still is filled to the working capacity, air is pumped through the flux. The reaction is exothermic, and water cooling is used to keep

the temperature at or below 260°C (500°F). When the desired softening point and flash point of the asphalt have been reached, the air is turned off, and blowing stops. The saturant or coating asphalt is pumped to storage tanks or to the process line.

Prior to conducting a performance test for a blowing still, the enforcement personnel conducting the performance test and the plant operator should coordinate the time required for the performance test with the time required to complete a blow. The performance tests should not require any change in the duration of the blowing cycle. A performance test will consist of three test runs. If the saturant blow is tested, the time required to complete a test run will be at least 90 minutes or the duration of the saturant blow whichever is greater. If the coating blow is tested, the test run will be for the duration of the coating blow or 90 minutes, whichever is greater. If a test run is not complete at the end of a single blow (in cases where one complete blow is less than 90 minutes), the test will be continued for the duration of a second blow. Coordination between the enforcement personnel and the plant operator will help ensure that valid data are collected for a complete performance test.

During the performance tests on the saturator, the production line should be operating at or above 80 percent of normal operating speed in order to be consistent with the procedures used during the emissions tests. The production line should be making a 106.6-kg (235-lb) shingle, or, if the line is only capable of producing a saturated felt, a 6.8-kg (15-lb) saturated felt. The fume temperature at the inlet to particulate control devices such as the HVAF and ESP should be recorded, and the operating temperature of the A/B should be recorded during the tests. Testing should be interrupted under any of the following conditions: if the production line is stopped or the saturator line speed is reduced below 80 percent of normal operating speed; if wide variations in the operating temperature of a control device occur; and during granule changing operations.

The felt used to make asphalt shingles, roll roofing, and saturated felt is made from waste paper or fiberglass. Felt breaks are a common occurrence in the operation of a shingle or saturated felt line. When

the felt breaks, it is necessary to stop production to repair or replace the felt in the roofing line. Depending upon the nature and location of the felt break, production could be stopped for a few minutes or for an hour or more.

The operation of the control device is not interrupted during these line stoppages; and therefore, there should be no excess emissions. A typical asphalt roofing plant operates 16 hours a day, 5 to 6 days a week (80 to 96 hours per week). Routine maintenance is performed during the shifts when the manufacturing process is down (70 to 88 hours per week). Most roofing plants have a two-week maintenance turnaround every year. During this two-week period, extensive repairs are carried out. The production capability may also be increased during this period.

The beginning and ending of a batch blowing still operation and halts in the production line to repair breaks in the felt are considered to be normal operation and would not by themselves result in excess emissions. Therefore, it is not necessary to record the beginning and ending of each batch or the halts in the production line to repair felt breaks as startup, shutdown, or malfunction.

DETERMINATION OF COMPLIANCE WITH THE MASS STANDARDS

The devices used to control particulate emissions from asphalt roofing plants exhaust effluents to the atmosphere through stacks. A method being proposed (EPA Reference Method 26) will provide specific guidelines for the measurement of particulate emissions from asphalt roofing plants in order to determine compliance with the mass standards.

An emission control system may serve several process operations. New equipment should be designed to facilitate emission testing. Sampling ports should be installed as shown in Method 1, the Federal Register, December 23, 1971. Sampling platforms and electrical outlets should be provided.

DETERMINATION OF COMPLIANCE WITH VISIBLE EMISSION STANDARDS

Opacity standards supplement the mass standards and help the plant operator determine that emission control devices are properly maintained and operated. Therefore, opacity standards have also been established for the affected facilities at asphalt roofing plants, oil refineries and

asphalt processing plants. Opacity observations will be made using Method 9.

A fugitive emission standard is proposed for the saturator capture system to ensure good capture of fugitive emissions from the saturator. During the test program, visible fugitive emissions recorded for the saturator capture system were considered valid only when the shingle production line was operating under representative conditions (at or above 80 percent of its normal line speed). The valid fugitive emission observations were recorded every 15 seconds. The data were then analyzed to determine the maximum period of time emissions were visible during any 60 minute period. Fugitive emissions were visible only when more than one enclosure door was open. Performance tests for saturator capture systems covered by the proposed standard should also be conducted only under representative conditions using Method 22. The performance test will consist of one test run. A test run will consist of valid consecutive readings totalling 60 minutes. The percent of time visible emissions are observed during this 60 minute period will be reported. This will ensure that the conditions during the performance test are consistent with those existing during the emissions testing program.

EMISSION MONITORING REQUIREMENTS

The recommended method for continuous monitoring of control devices for the saturator and coater and the blowing still is to record the operating temperatures of the control devices. The monitoring point for particulate control devices, such as the HVAF and ESP, is located at the inlet of the control devices. The A/B monitoring points are located in the combustion zone or the area immediately after the combustion zone. Temperature monitoring and recording equipment would increase the capital and annualized pollution control equipment costs by an estimated 2 to 4 percent.

The recommended standards do not require continuous monitoring systems for opacity. The oil and asphalt particles exist as a vapor at the temperature of the fume. The vapor will not be detected by the transmissometer but will condense and be visible in the atmosphere. For this reason the transmissometer would not be a good indicator of emissions

from the control devices in the asphalt processing and roofing industry. In addition, the estimated costs of procurement and installation (about $20,000) and annual maintenance (about $9,000) of the transmissometer are considered excessive compared to the cost of the control equipment needed to meet the emission limits for the new source performance standard.

Reference Method 9 will be used to monitor the opacity of the emissions from the mist eliminator controlling the asphalt storage tank and the baghouse controlling the mineral handling and storage.

REPORTS IMPACT ANALYSIS (EPA ESTIMATE)
Asphalt Processing and Asphalt Roofing Manufacture

The following describes the reporting requirements associated with the new source performance standards (NSPS) for Asphalt Processing and Asphalt Roofing Manufacture. Estimates of the labor and cost impacts on both the industry and the U.S. Environmental Protection Agency (EPA) are presented. These analyses must be prepared for all new significant regulations as required in EPA's final plan to implement E.O. 12044 entitled "Improving Government Regulations." The analysis results are discussed in the preamble to the regulation and in the action memorandum for the Administrator.

1.0 LEGAL AUTHORITY

The EPA proposes standards of performance to limit emissions of particulate from new stationary sources in Asphalt Processing and Asphalt Roofing Manufacture under the authority of Section 111 of the Clean Air Act (42 U.S.C. 7411). The reporting requirements necessitated by the NSPS are mandated in Section 114(a), paragraph 1 of the same act.

2.0 BACKGROUND

2.1 PURPOSE

The collection and maintenance of accurate reporting data is essential for determining compliance with the NSPS. The data provide enforcement authorities (EPA) with a historical record on the performance of a particular firm in its attempt to comply with the standard.

2.2 NARRATIVE DESCRIPTION

It is estimated that 3 new medium size plants will have to comply with the NSPS reporting requirements through the fifth year (1985) of

applicability. This estimate is based on the industry having a 1-1/2 to 2 percent growth.

The industry will have to submit continuous monitoring system performance evaluation reports and notification of demonstration of the continuous monitoring system. The operating temperature of the control device will have to be continuously monitored and recorded. Quarterly excess emission reports are required. A malfunction or unscheduled shutdown should also be reported to the State regulatory agency.

3.0 ALTERNATIVES

The use of instruments to measure and record the operating temperature of the saturator and blowing still control device is the most effective method studied for continuous monitoring. The particulate emitted from the saturator and blowing still is a hydrocarbon which can be destroyed by burning or collected by condensation. The operating temperature of the control device is directly related to the control efficiency of the control equipment used in this industry. The temperature records will assist operating and enforcement personnel in determining the efficiency of the control equipment and the need for maintenance.

4.0 IMPACT ANALYSIS

4.1 DEFINITIONS

Mass-produced facility: An affected facility that was produced in an assembly line fashion at a rate of more than 10 per year.

4.2 PRIMARY IMPACTS--LABOR AND COSTS

This section identifies the burden in terms of work hours and dollars on the respondents and the Agency to collect, prepare, and use the data required by the standard.

4.2.1 RESPONDENT LABOR REQUIREMENTS--111(b)

This section discusses the labor requirements for the respondents to meet the reporting requirements of standards developed under Section 111(b) of the Clean Air Act. The results represent the labor requirements through the year 1985, which would be the fifth year of applicability of the standard.

The facilities are considered to be non-mass-produced facilities for this estimate. It is assumed that one new plant will be built in the first year, one new plant in each of the third and fourth years. Therefore, over the five year period the total expansion would be represented by three new plants. The labor requirements are calculated for the following reports.

1. Notification of construction [required under § 60.7(a)(1)]:

   3 reports x 2 man-hours/report = 6 man-hours

2. Notification of anticipated startup [required under § 60.7(a)(2)]:

   3 reports x 2 man-hours/report = 6 man-hours

3. Notification of actual initial startup [required under § 60.7(a)(3)]: 3 reports x 2 man-hours/report = 6 man-hours

4. Notification of physical or operational changes [required under § 60.7(a)(4)]: Estimated from Chapter 5 of BID for existing plants:

   -NONE EXPECTED-

5. Notification of demonstration of the continuous monitoring systems [required under § 60.7(a)(5)]:

   5 reports x 2 man-hours/report = 10 man-hours

6. Continuous monitoring system performance evaluation report [required under § 60.13(c)]:

   5 reports x 40 man-hours/report = 200 man-hours

7. Maintenance of records of startups, shutdowns, and malfunctions of the pollution control device or periods of inoperation of the continuous monitor [required under § 60.7(b)]:

Year	Total records	Man-hours	=	Total man-hours
1st	1	80/record	=	80
2nd	1		=	80
3rd	2		=	160
4th	3		=	240
5th	3		=	240
Total	3		=	800

8. Excess emissions report [submitted quarterly under § 60.7(c)]:

Year	Total plants	No excess emissions report	Man-hours	Excess emissions report	Man-hours	Total man-hours
1st	1	x [(3/per year x 8/report) +		(1/plant x	40/report)]	= 64
2nd	1					= 64
3rd	2					= 128
4th	3					= 192
5th	3					= 192
Total	3	30 no reports		10 excess reports		640

9. Maintenance of a file of all measurements as described in Section 60.7(d) of the General Provisions [required under § 60.7(d)]: This includes the inlet temperature to the saturator control devices (HVAF, ESP) and the operating temperaturing of the afterburner):

Year	Total plants	Man-hours	=	Total Man-hours
1st	1	80/plant	=	80
2nd	1		=	80
3rd	2		=	160
4th	3		=	240
5th	3		=	240
Total	3		=	800

10. Notification to the Administrator prior to a performance test [required under § 60.8(d)]:

5 reports x 2 man-hours/report = 10 man-hours

11. Performance test report [required under § 60.8(a)]:

5 reports x 80 man-hours/report = 400 man-hours

12. Temperature records recalibration. The operating temperature of the control devices must be continuously measured and recorded. Each recorder must be recalibrated at least semi-annually. The recalibration procedure is assumed to require a total of three man-hours. The number of new temperature recorders installed each year is estimated as follows:

Year	Number of installed recorders
1st	3
2nd	3
3rd	6
4th	9
5th	9

The associated labor requirements would be as follows:

Year	Total recorders	x	Calibrations	x	Man-hours	=	Total man-hours
1st	3	x	2/yr	x	3/calibration	=	18
2nd	3					=	18
3rd	6					=	36
4th	9					=	54
5th	9					=	54
Total	9					=	180

TOTAL ASPHALT PROCESSING AND ASPHALT ROOFING MANUFACTURE LABOR TIME FOR THE 5-YEAR STANDARD: 3,058 man-hours

4.2.2. AGENCY LABOR REQUIREMENTS--111(b)

The total labor time for the EPA to fulfill the reporting requirements, through the fifth year of applicability of the standard, is estimated. The facilities are considered to be non-mass produced for this estimate.

1. Review notification of construction:

   3 reports x 2 man-hours/report = 6 man-hours

2. Review notification of anticipated startup:

   3 reports x 2 man-hours/report = 6 man-hours

3. Review notification of actual startup:

   3 reports x 2 man-hours/report = 6 man-hours

4. Review notification of physical or operational changes:

   -NONE EXPECTED-

5. Review notification of demonstration of the continuous monitoring system:

   5 reports x 2 man-hours/report = 10 man-hours

6. Review continuous monitoring system performance evaluation report: 5 reports x 16 man-hours/report = 80 man-hours

7. Review excess emission reports:

   No excess:

   30 reports x 2 man-hours/report = 60 man-hours

   Excess emissions:

   10 reports x 8 man-hours/report = 80 man-hours

8. Review notification to the Administrator prior to a performance test: 5 reports x 2 man-hours/report = 10 man-hours

9. Review performance test reports:

5 reports x 8 man-hours/report = 40 man-hours

TOTAL LABOR TIME FOR THE FIVE-YEAR STANDARD: 298 man-hours

4.2.3 RESPONDENT AND AGENCY COSTS

The total labor costs for the asphalt processing and asphalt roofing manufacture industry to fulfill the reporting requirements through the year 1985 is estimated as follows:

3,058 man-hours x $15.00/h = $45,870

298 man-hours x $15.00/h = $ 4,470

TOTAL $50,340

4.3 PERSONNEL IMPACTS

The additional personnel requirements can be estimated by assuming a certain amount of available man-hours per year. The annual working hours are determined by assuming eight holidays and two vacation weeks per year:

40 hours/week x 50 weeks/year = 2,000 hours/year
-8 hours x 8 holidays/year = -64 hours/year
1,936 hours/year

Therefore, the following additional personnel would be required over the five years of applicability:

INDUSTRY

$$\frac{3{,}058 \text{ man-hours over 5 years}}{(1{,}936 \text{ hours/yr})(5 \text{ years})} = 0.32 \text{ persons}$$

EPA

$$\frac{298 \text{ man-hours over 5 years}}{(1{,}936 \text{ hours/yr})(5 \text{ years})} = 0.03 \text{ persons}$$